

Date: Monday, 24/11/2008 9:17:48 AM
 User: Linda Lacelle

Process Sheet

Customer : CC-DAR01 Dart Aerospace Ltd.

Job Number : 43704

Estimate Number : 10804

P.O. Number :

This Issue : 24/11/2008 S.O. No. :

Prsht Rev. : NC

First Issue : 24/11/2008 Type : CROSTUBES

Previous Run : 00015

Written By : Checked & Approved By : 

Comment :

Drawing Name : D407-667-205

Part Number : REWORK11

Drawing Number : ECN08-561

Project Number :

Drawing Revision :

Material :

Due Date : 28/11/2008 Qty: 3 Um: Each

Additional Product

Job Number:



DART Dart Aerospace Ltd. 1270 ABERDEEN ST. HAWKESBURY, ON, CANADA K6A 1K7		TC APPROVAL # 09-89 TEL: 1-613-632-5200	
P/N	D407-667-205	CHG	CHG006
DESC.	Crosstube Aft High	STC	SH01-5
LOT	B43213	STC	SR01304NY
MODEL	Bell 407	STC	
MADE IN CANADA		D2729-1	

Seq. #: Machine Or Operation:

Description :

1.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

PULL FROM STOCK:

D407-667-205 B 43213
 B 41387
 B 41386

DART Dart Aerospace Ltd. 1270 ABERDEEN ST. HAWKESBURY, ON, CANADA K6A 1K7		TC APPROVAL # 09-89 TEL: 1-613-632-5200	
P/N	D407-667-205	CHG	CHG006
DESC.	Crosstube Aft High	STC	SH01-5
LOT	B41387	STC	SR01304NY
MODEL	Bell 407	STC	
MADE IN CANADA		D2729-1	

m 08 11 26 (3)

2.0

CROSTUBES

CROSTUBES RESOURCE 1



Comment: CROSTUBES RESOURCE 1

REMOVE SUPPORTS

D2894-1 B 35578
 B 21475

GIVE TO MACHINING (JL)

DART Dart Aerospace Ltd. 1270 ABERDEEN ST. HAWKESBURY, ON, CANADA K6A 1K7		TC APPROVAL # 09-89 TEL: 1-613-632-5200	
P/N	D407-667-205	CHG	CHG006
DESC.	Crosstube Aft High	STC	SH01-5
LOT	B41386	STC	SR01304NY
MODEL	Bell 407	STC	
MADE IN CANADA		D2729-1	

m 08 11 26 (3)

3.0

HAAS1

HAAS CNC VERTICAL MACHINING #1



Comment: HAAS CNC VERTICAL MACHINING #1

REWORK SUPPORTS PER ECN 08-561
 PER DRWG D2894-1 REV D

08.11.26

Date: Monday, 24/11/2008 9:17:48 AM
User: Linda Lacelle

Process Sheet

Customer: CC-DAR01 Dart Aerospace Ltd.

Drawing Name: D407-667-205

Job Number: 43704

Part Number: REWORK11

Job Number:



Seq. #:

Machine Or Operation:

Description :

4.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

5.0

QC8

SECOND CHECK



Comment: SECOND CHECK

6.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING
REPAINT REWORKED AREA

7.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

8.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: CROSSTUBES RESOURCE 1 B# 108966 EXP: 10-2009
Torque: ml 08 12 02 (3)
RE-INSTALL SUPPORTS ON CROSSTUBES
D407-667-205 PER DRWG D407-667-245, REV.F

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

10.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

ENSURE ORIGINAL KITS WITH PROPER CROSSTUBE

11.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

REPACKAGE USING ORIGINAL B/N

343704 D407-667-205

Date: Monday, 24/11/2008 9:17:48 AM
User: Linda Lacelle

Process Sheet

Customer: CC-DAR01 Dart Aerospace Ltd.

Drawing Name: D407-667-205

Job Number: 43704

Part Number: REWORK11

Job Number:



Seq. #:

Machine Or Operation:

Description :

12.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

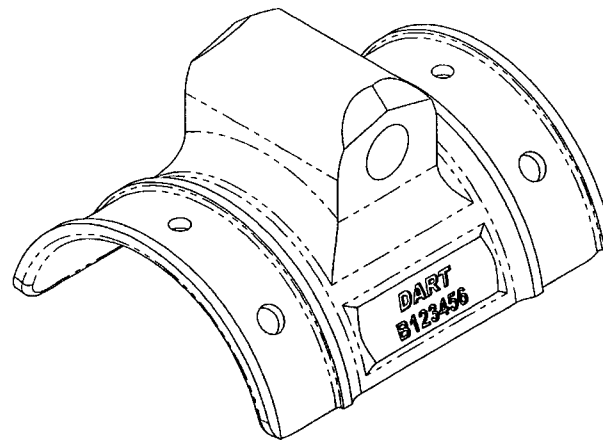
**ADD A COPY OF THIS W/O WITH
EACH OF THE ABOVE CROSSTUBE W/O'S****

08/12/04 [Signature]

Job Completion



MF 08-12-03



D2894-1 Ø2.750 SUPPORT

RELEASED
08/11/09

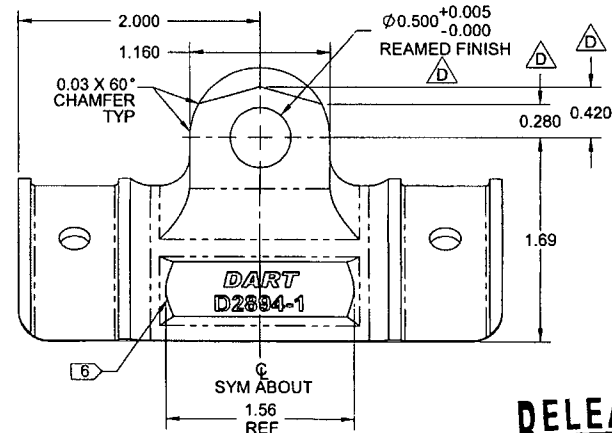
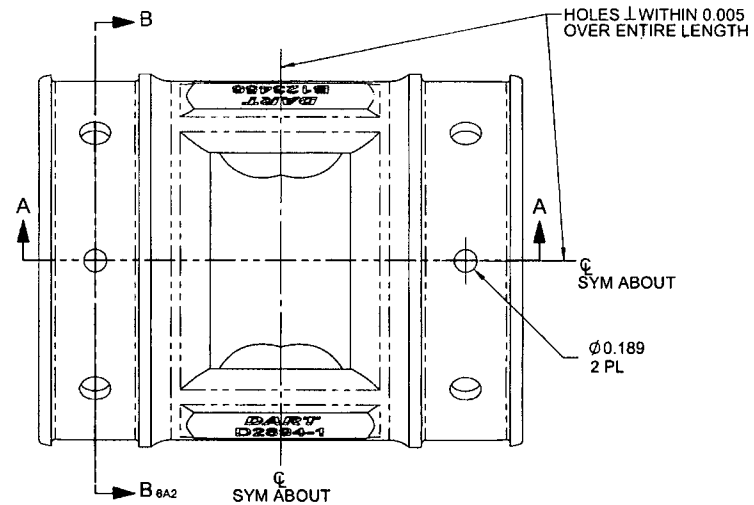
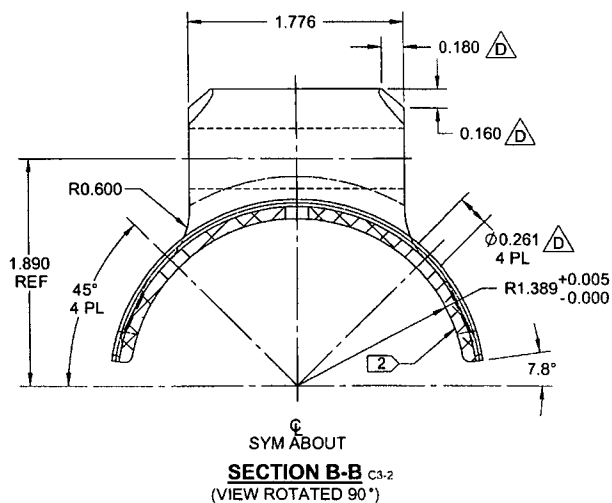
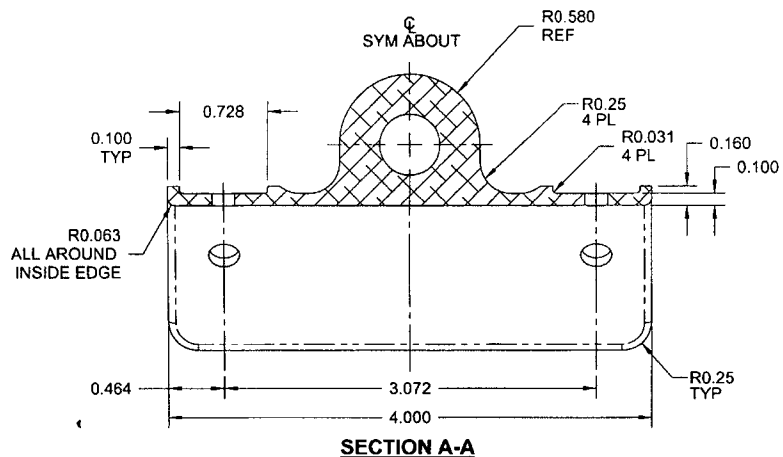
NOTES:

- 1) MATERIAL: 17-4 PH STAINLESS STEEL
HEAT TREAT TO H900 CONDITION
(900°F FOR 1 HR. AIR COOL)
MIN UTS = 170 KSI (38 HRC)
- 2) FINISH: PRIME INSIDE SURFACE AS SHOWN PER DART QSI 005 4.2
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.010 TO 0.020 MAX
- 6) 0.50" WIDE x 1.56" LONG x 0.005" MIN HEIGHT FLAT,
WITH R0.25 RADIUS OF TRANSITION IN THIS AREA
IDENTIFY WITH DART LOGO AND PART NUMBER ON ONE
SIDE AND DART LOGO AND BATCH NUMBER ON OPPOSITE
SIDE USING 0.010-0.020 DEEP LETTERING
- 7) WEIGHT: 0.98 lbs

Handwritten signature/initials



D	DRAWING REFORMATTED. POWDER COAT FINISH REMOVED. CHAMFERS ADDED TO TOP OF PART TO CLEAR ROCKER BEAM. PER BELL TECH BULLETIN 407-08-84. B5-2 0.261 HOLE WAS 0.257. B2-2 REAM FINISH INSTRUCTION ADDED.	AJS	08.11.06
C	ADD MASKING AND PRIME ONLY NOTES, REFORMATTED DRAWING.	DC	07.07.04
B	AS MANUFACTURED	CP	02.07.17
A	NEW ISSUE	CP	02.04.02
REV.	DESCRIPTION	BY	DATE
DESIGN	CP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AJS		
CHECKED		DRAWING NO.	REV. D
MFG. APPR.		D2894	SHEET 1 OF 2
APPROVED		TITLE	SCALE
DE APPR.		Ø2.750 SUPPORT	NTS
DATE	08.11.06	<small>COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR DISCLOSED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

8 7 6 5 4 3 2 1



D2894-1 Ø2.750 SUPPORT

RELEASED
06/11/19

DESIGN	DS	DART AEROSPACE LTD	
DRAWN	AJS	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. D
MFG. APPR.		D2894	SHEET 2 OF 2
APPROVED		TITLE	SCALE
DE APPR.		Ø2.750 SUPPORT	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD	
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

Mo 43704

8 7 6 5 4 3 2 1

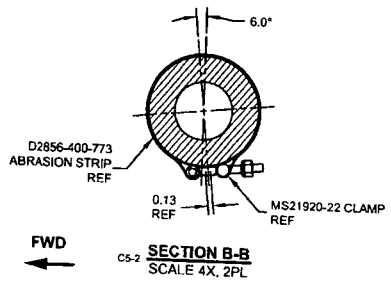
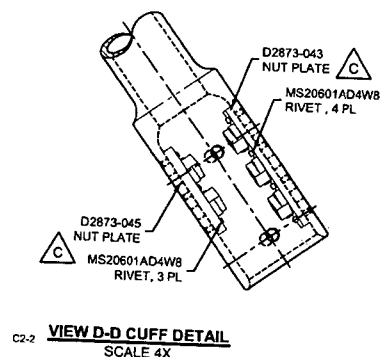
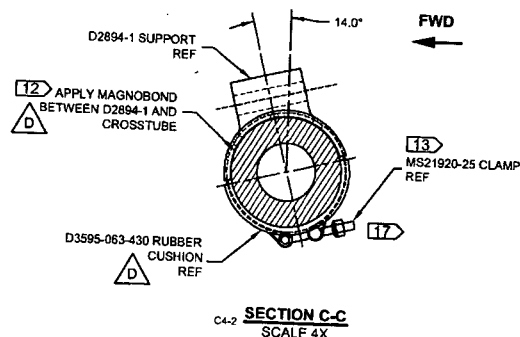
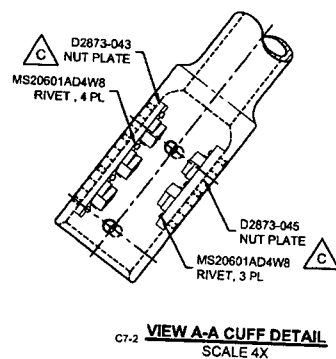
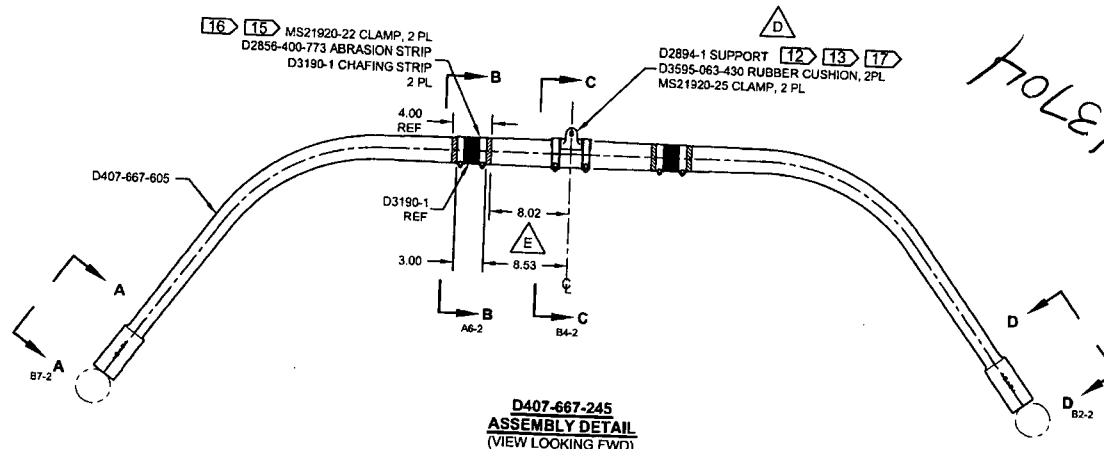
Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON
INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND
6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO
PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE
SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS.
ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF
CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE
OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
8/11/12

F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	*03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. F
MFG. APPR.	RF	D407-667-245	SHEET 1 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

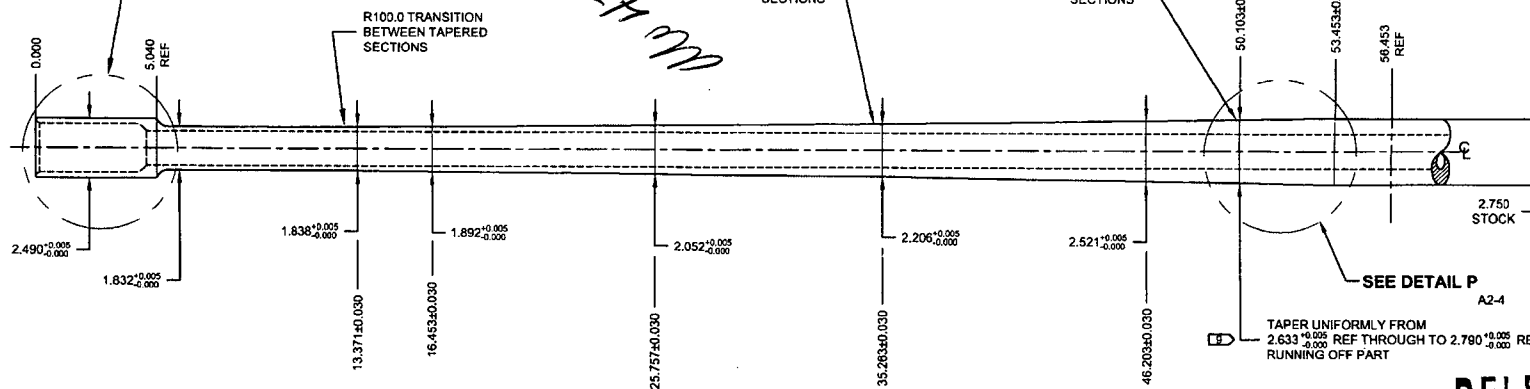


RELEASED
02/11/12

DESIGN	9	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	9	DRAWING NO.	REV. F
MFG. APPR.	9	D407-667-245	SHEET 2 OF 4
APPROVED	9	TITLE	SCALE
DE APPR.	9	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	<small>COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD</small>	

hole mm

SEE DETAIL M
A7-4

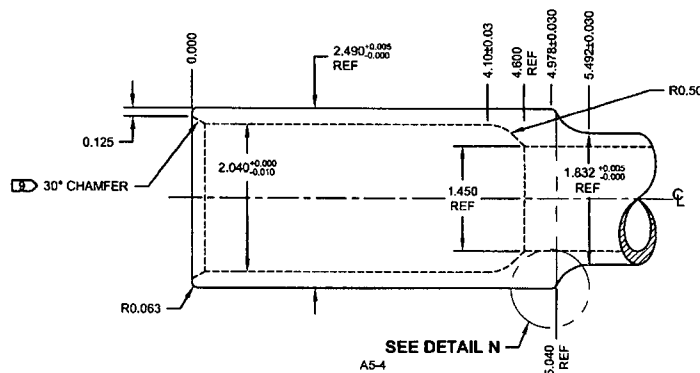


SEE DETAIL P
A2-4

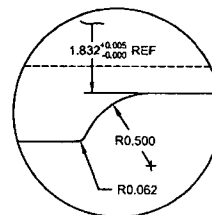
TAPER UNIFORMLY FROM
2.633^{+0.005}/_{-0.000} REF THROUGH TO 2.790^{+0.005}/_{-0.000} REF
RUNNING OFF PART

D407-667-245 MACHINING DETAIL

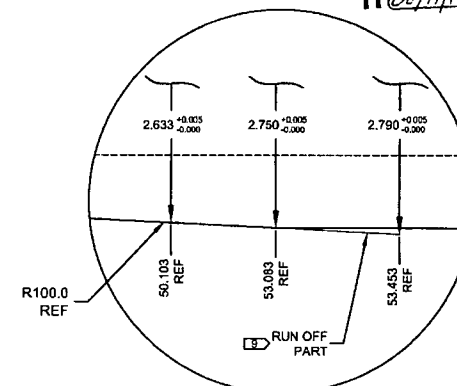
RELEASED
08/11/12



DETAIL M: CROSSTUBE CUFF
SCALE 3X



DETAIL N: CUFF TRANSITION
SCALE 2X



DETAIL P: TAPER RUN-OFF
NOT TO SCALE

DESIGN	90	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. F
MFG. APPR.	RF	D407-667-245	SHEET 4 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASSY (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD	
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE REPRODUCED OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

ENGINEERING CHANGE NOTICE
DART AEROSPACE LTD

Date: 08.11.19	Job No.: 00569	ADR Yes/No: Y	ADR Date: 08.11.07	ECN #: 08- 561
Product No.: D407-667-205		Created By: <i>[Signature]</i>	Approved By:	
Product Name: CROSSTUBE		Checked By: <i>[Signature]</i>	General Manager Approval:	

Distribution	Reqd	Resp	Initial / Date
Production Manager	Y	LL	
Production Engineering Coord	Y	JLM	
Production Document Control	N		
Customer Technical Support	N		

Distribution	Reqd	Resp	Initial / Date
DQA / QA Coord	N		
QC Coordinator	N		
Marketing	N		
Customer Order Processing	N		

Reason for Change: BELL REDESIGN OF AIRCRAFT ROCKER BEEM SEE ADR DATED 08-11.07 FOR FURTHER DETAILS

Documents Affected:
D2894 REV D

PARTS MUST COMPLY ☒ PREVIOUS PARTS SATISFACTORY ☐

#	Quality Assurance Actions	Reqd	Resp	Notes	Complete
1	Notify Previous Customers	N			
2	Notify Eurocopter France	N			
3					

#	Engineering Actions	Reqd	Resp	Notes	Complete
4	Required Documents/Drawings Under Review	N			
5	Update Product Compatability Matrix	N			
6	Create Eurocopter Form (FEE)	N			
7	Notify TC / FAA of Change	N			

#	Document Control Actions	Reqd	Resp	Notes	Complete
8	Move Electronic Files	Y	KJ		08.11.20 <i>[Signature]</i>
9	Update Blue/Pink/DSI Folder and Electronic Files	N			
10	Update Controlled PDF Files	Y	KJ		08.11.20 <i>[Signature]</i>
11	Update Master Document List (MDL)	Y	AJS		08.11.20 <i>[Signature]</i>
12	Update Document Record (DR)	Y	KJ	Rev. M	08.11.20 <i>[Signature]</i>
13	Update Product Development Summary	N			
14	Update QSI 021 and/or STC Approval List	N			
15	Update Parts / STC Database	N			
16	Update / Verify ARC Database	N			
17	Create / Update Change Record Form	N			
18	Create / Update PPP's	N			
19	Update Document Control Database / Laminated Dwgs	Y	KJ		
20	Update Grey Project Binder	Y	AJS		08.11.20 <i>[Signature]</i>
21	Update D-Part/M-Drawing/DSI/DEO Master Binders	Y	KJ		08.11.20 <i>[Signature]</i>
22					
23					

Description / Action:
RELEASE D2894 REV D

ALL PARTS IN HAWKESBURY STOCK MUST COMPLY, REWORK EXISTING STOCK.

40 *43704*

ECN Verified & Complete: _____ Date: _____

•Date: Thursday, 04/12/2008 8:59:28 AM
User: Linda Lacelle

JOB HISTORY : DETAIL

Job Number	: 43704	Customer	: Dart Aerospace Ltd.
Estimate Number	: 10804	DWG Name	: D407-667-205
Purchase Order #	:	Part Number	: REWORK11
Complete Date	: 03/12/2008 3:54:41	DWG Number	: ECN08-561
		Rev.	:

DUE DATE	ORDERED	DELIVERED
28/11/2008	3	X O

2.0 CROSSTUBES Internal Operation

DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach. Cost
24/11/2008	MURD02: Murdoch, Matthew	Run	0.000	2.26	\$36.52	2.26	90.20
26/11/2008	MURD02: Murdoch, Matthew	Run	0.000	3.45	\$55.75	3.45	137.70

Subtotal: QTD: 0 CTD: 0 5.71 \$320.17

6.0 POWDER COATING Internal Operation

DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach. Cost
27/11/2008	MURD02: Murdoch, Matthew	Run	3.000	2.22	\$35.88	2.22	87.19

Subtotal: QTD: 3 CTD: 0 2.22 \$123.07

8.0 CROSSTUBES Internal Operation

DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach. Cost
01/12/2008	MURD02: Murdoch, Matthew	Run	3.000	2.60	\$42.02	2.60	103.79
02/12/2008	MURD02: Murdoch, Matthew	Run	0.000	3.55	\$57.37	3.55	141.70

Subtotal: QTD: 3 CTD: 0 6.15 \$344.88

	TIME	COST
Machine Time:	14.08	\$560.58
Labor:	14.08	\$227.54
Sub-contract (external Op.):		\$0.00
INVENTORY ITEM:		\$0.00
SUB-COMPONENT (SUB-JOB):		\$0.00
Total:		\$788.12

COST PER UNIT: \$262.70